RAW SEQUENCE LISTING
PATENT APPLICATION: **US/09/689,159A**

DATE: 12/31/2002
TIME: 14:09:11

Input Set : **A:\Sequence Listing (ASCII copy) - US7.txt**
Output Set: **N:\CRF4\12312002\I689159A.raw**

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 3 <110> APPLICANT: St. George-Hyslop, Peter H
 4         Rommens, Johanna M
 5         Fraser, Paul E
 7 <120> TITLE OF INVENTION: GENETIC SEQUENCES AND PROTEINS RELATED TO ALZHEIMER'S
DISEASE
 9 <130> FILE REFERENCE: 1034/1F808US7
11 <140> CURRENT APPLICATION NUMBER: US 09/689,159A
12 <141> CURRENT FILING DATE: 2000-10-12
14 <150> PRIOR APPLICATION NUMBER: US 08/509,359
15 <151> PRIOR FILING DATE: 1995-07-31
17 <160> NUMBER OF SEQ ID NOS: 185
19 <170> SOFTWARE: PatentIn version 3.1
21 <210> SEQ ID NO: 1
22 <211> LENGTH: 2791
23 <212> TYPE: DNA
24 <213> ORGANISM: Homo sapiens
26 <220> FEATURE:
27 <221> NAME/KEY: misc_feature
28 <222> LOCATION: (1)..(2791)
29 <223> OTHER INFORMATION: where n may be either a or g or c or t/u, unknown or other
32 <400> SEQUENCE: 1
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W--> `35 gaaggaacct gagctacgag ccgcggcggc agcggggcgg cggggnaagc gtatacctaa   120`

```
37 tctgggagcc tgcaagtgac aacagccttt gcggtcctta gacagcttgg cctggaggag   180
39 aacacatgaa agaaagaacc tcaagaggct ttgttttctg tgaaacagta tttctataca   240
41 gttgctccaa tgacagagtt acctgcaccg ttgtcctact tccagaatgc acagatgtct   300
43 gaggacaacc acctgagcaa tactgtacgt agccagaatg acaatagaga acggcaggag   360
45 cacaacgaca gacggagcct tggccaccct gagccattat ctaatggacg accccagggt   420
47 aactcccggc aggtggtgga gcaagatgag gaagaagatg aggagctgac attgaaatat   480
49 ggcgccaagc atgtgatcat gctctttgtc cctgtgactc tctgcatggt ggtggtcgtg   540
51 gctaccatta agtcagtcag cttttatacc cggaaggatg ggcagctaat ctatacccca   600
53 ttcacagaag ataccgagac tgtgggccag agagccctgc actcaattct gaatgctgcc   660
55 atcatgatca gtgtcattgt tgtcatgact atcctcctgg tggttctgta aaatacagg    720
57 tgctataagg tcatccatgc ctggcttatt atatcatctc tattgttgct gttctttttt   780
59 tcattcattt acttggggga agtgtttaaa acctataacg ttgctgtgga ctacattact   840
61 gttgcactcc tgatctggaa tttgggtgtg gtgggaatga tttccattca ctggaaaggt   900
63 ccacttcgac tccagcaggc atatctcatt atgattagtg ccctcatggc cctggtgttt   960
65 atcaagtacc tccctgaatg gactgcgtgg ctcatcttgg ctgtgatttc agtatatgat  1020
67 ttagtggctg ttttgtgtcc gaaaggtcca cttcgtatgc tggttgaaac agctcaggag  1080
69 agaaatgaaa cgcttttttcc agctctcatt tactcctcaa caatggtgtg gttggtgaat  1140
71 atggcagaag gagacccgga agctcaaagg agagtatcca aaaattccaa gtataatgca  1200
73 gaaagcacag aaaggggagtc acaagacact gttgcagaga atgatgatgg cgggttcagt  1260
75 gaggaatggg aagcccagag ggacagtcat ctagggcctc atcgctctac acctgagtca  1320
77 cgagctgctg tccaggaact ttccagcagt atcctcgctg gtgaagaccc agaggaaagg  1380
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 81 gcaacagcca gtggagactg gaacacaacc atagcctgtt tcgtagccat attaattggt   1500
 83 ttgtgcctta cattattact ccttgccatt ttcaagaaag cattgccagc tcttccaatc   1560
 85 tccatcacct ttgggcttgt tttctacttt gccacagatt atcttgtaca gcctttttatg   1620
 87 gaccaattag cattccatca attttatatc tagcatattt gcggttagaa tcccatggat   1680
 89 gtttcttctt tgactataac caaatctggg gaggacaaag gtgattttcc tgtgtccaca   1740
 91 tctaacaaag tcaagattcc cggctggact tttgcagctt ccttccaagt cttcctgacc   1800
 93 accttgcact attggacttt ggaaggaggt gcctatagaa aacgattttg aacatacttc   1860
 95 atcgcagtgg actgtgtcct cggtgcagaa actaccagat ttgagggacg aggtcaagga   1920
 97 gatatgatag gcccggaagt tgctgtgccc catcagcagc ttgacgcgtg gtcacaggac   1980
 99 gatttcactg acactgcgaa ctctcaggac taccggttac caagaggtta ggtgaagtgg   2040
101 tttaaaccaa acggaactct tcatcttaaa ctacacgttg aaaatcaacc caataattct   2100
103 gtattaactg aattctgaac ttttcaggag gtactgtgag gaagagcagg caccagcagc   2160
105 agaatgggga atggagaggt gggcagggt tccagcttcc ctttgatttt ttgctgcaga   2220
107 ctcatccttt ttaaatgaga cttgttttcc cctctctttg agtcaagtca aatatgtaga   2280
109 tgcctttggc aattcttctt ctcaagcact gacactcatt accgtctgtg attgccattt   2340
111 cttcccaagg ccagtctgaa cctgaggttg ctttatccta aaagtttttaa cctcaggttc   2400
113 caaattcagt aaattttgga aacagtacag ctatttctca tcaattctct atcatgttga   2460
115 agtcaaattt ggattttcca ccaaattctg aatttgtaga catacttgta cgctcacttg   2520
117 ccccagatgc ctcctctgtc ctcattcttc tctcccacac aagcagtctt tttctacagc   2580
119 cagtaaggca gctctgtcgt ggtagcagat ggtcccactt attctagggt cttactcttt   2640
121 gtatgatgaa aagaatgtgt tatgaatcgg tgctgtcagc cctgctgtca gaccttcttc   2700
123 cacagcaaat gagatgtatg cccaaagcgg tagaattaaa gaagagtaaa atggctgttg   2760
125 aagcaaaaaa aaaaaaaaaa aaaaaaaaaa a                                   2791
128 <210> SEQ ID NO: 2
129 <211> LENGTH: 467
130 <212> TYPE: PRT
131 <213> ORGANISM: Homo sapiens
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140             20                  25                  30
143 Arg Glu Arg Gln Glu His Asn Asp Arg Arg Ser Leu Gly His Pro Glu
144         35                  40                  45
147 Pro Leu Ser Asn Gly Arg Pro Gln Gly Asn Ser Arg Gln Val Val Glu
148     50                  55                  60
151 Gln Asp Glu Glu Glu Asp Glu Glu Leu Thr Leu Lys Tyr Gly Ala Lys
152 65                  70                  75                  80
155 His Val Ile Met Leu Phe Val Pro Val Thr Leu Cys Met Val Val Val
156             85                  90                  95
159 Val Ala Thr Ile Lys Ser Val Ser Phe Tyr Thr Arg Lys Asp Gly Gln
160             100                 105                 110
163 Leu Ile Tyr Thr Pro Phe Thr Glu Asp Thr Glu Thr Val Gly Gln Arg
164         115                 120                 125
167 Ala Leu His Ser Ile Leu Asn Ala Ala Ile Met Ile Ser Val Ile Val
168         130                 135                 140
171 Val Met Thr Ile Leu Leu Val Val Leu Tyr Lys Tyr Arg Cys Tyr Lys
172 145                 150                 155                 160
```

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175 Val Ile His Ala Trp Leu Ile Ile Ser Ser Leu Leu Leu Leu Phe Phe
176             165             170             175
179 Phe Ser Phe Ile Tyr Leu Gly Glu Val Phe Lys Thr Tyr Asn Val Ala
180             180             185             190
183 Val Asp Tyr Ile Thr Val Ala Leu Leu Ile Trp Asn Leu Gly Val Val
184         195             200             205
187 Gly Met Ile Ser Ile His Trp Lys Gly Pro Leu Arg Leu Gln Gln Ala
188     210             215             220
191 Tyr Leu Ile Met Ile Ser Ala Leu Met Ala Leu Val Phe Ile Lys Tyr
192 225             230             ·    235                 240
195 Leu Pro Glu Trp Thr Ala Trp Leu Ile Leu Ala Val Ile Ser Val Tyr
196         .       245             250             255
199 Asp Leu Val Ala Val Leu Cys Pro Lys Gly Pro Leu Arg Met Leu Val
200             260             265             270
203 Glu Thr Ala Gln Glu Arg Asn Glu Thr Leu Phe Pro Ala Leu Ile Tyr
204         275         .       280         .       285
207 Ser Ser Thr Met Val Trp Leu Val Asn Met Ala Glu Gly Asp Pro Glu
208     290             295             300
211 Ala Gln Arg Arg Val Ser Lys Asn Ser Lys Tyr Asn Ala Glu Ser Thr
212 305             310             315                 320
215 Glu Arg Glu Ser Gln Asp Thr Val Ala Glu Asn Asp Asp Gly Gly Phe
. 216             325             330  ·           335
219 Ser Glu Glu Trp Glu Ala Gln Arg Asp Ser His Leu Gly Pro His Arg
220         340             345             350
223 Ser Thr Pro Glu Ser Arg Ala Ala Val Gln Glu Leu Ser Ser Ser Ile
224         355             360             365
227 Leu Ala Gly Glu Asp Pro Glu Glu Arg Gly Val Lys Leu Gly Leu Gly
228     370             375             380
231 Asp Phe Ile Phe Tyr Ser Val Leu Val Gly Lys Ala Ser Ala Thr Ala
232 385             390             395                 400
235 Ser Gly Asp Trp Asn Thr Thr Ile Ala Cys Phe Val Ala Ile Leu Ile
236             405             410             415
239 Gly Leu Cys Leu Thr Leu Leu Leu Leu Ala Ile Phe Lys Lys Ala Leu
240         420             425             430
243 Pro Ala Leu Pro Ile Ser Ile Thr Phe Gly Leu Val Phe Tyr Phe Ala
244         435             440             445
247 Thr Asp Tyr Leu Val Gln Pro Phe Met Asp Gln Leu Ala Phe His Gln
248     450             455             460
251 Phe Tyr Ile
252 465
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256 <211> LENGTH: 1929
257 <212> TYPE: DNA
258 <213> ORGANISM: Mus musculus
260 <220> FEATURE:
261 <221> NAME/KEY: misc_feature
262 <222> LOCATION: (1)..(1929)
263 <223> OTHER INFORMATION: where n may be either a or g or c or t/u, unknown or other
266 <400> SEQUENCE: 3
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RAW SEQUENCE LISTING   DATE: 12/31/2002
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Input Set : **A:\Sequence Listing (ASCII copy) - US7.txt**
Output Set: **N:\CRF4\12312002\I689159A.raw**

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W--> 267 accanacanc ggcagctgag gcggaaacct aggctgcgag ccggccgccc gggcgcggag     60
     269 agagaaggaa ccaacacaag acagcagccc ttcgaggtct ttaggcagct tggaggagaa    120
     271 cacatgagag aaagaatccc aagaggtttt gttttctttg agaaggtatt tctgtccagc    180
     273 tgctccaatg acagagatac ctgcaccttt gtcctacttc cagaatgccc agatgtctga    240
     275 ggacagccac tccagcagcg ccatccggag ccagaatgac agccaagaac ggcagcagca    300
     277 gcatgacagg cagagacttg acaaccctga gccaatatct aatgggcggc cccagagtaa    360
     279 ctcaagacag gtggtggaac aagatgagga ggaagacgaa gagctgacat tgaaatatgg    420
     281 agccaagcat gtcatcatgc tctttgtccc cgtgaccctc tgcatggtcg tcgtcgtggc    480
     283 caccatcaaa tcagtcagct tctatacccg gaaggacggt cagctaatct acaccccatt    540
     285 cacagaagac actgagactg taggccaaag agccctgcac tcgatcctga atgcggccat    600
     287 catgatcagt gtcattgtca ttatgaccat cctcctggtg gtcctgtata aatacaggtg    660
     289 ctacaaggtc atccacgcct ggcttattat ttcatctctg ttgttgctgt tcttttttc     720
     291 gttcatttac ttaggggaag tatttaagac ctacaatgtc kccgtggact acgttacagt    780
     293 agcactccta atctggaatt ggggtgtggt cgggatgatt gccatccact ggaaaggccc    840
     295 ccttcgactg cagcaggcgt atctcattat gatcagtgcc ctcatggccc tggtatttat    900
     297 caagtacctc cccgaatgga ccgcatggct catcttggct gtgatttcag tatatgattt    960
     299 ggtggctgtt ttatgtccca aaggcccact tcgtatgctg gttgaaacag ctcaggaaag   1020
     301 aaatgagact ctctttccag ctcttatcta ttcctcaaca atggtgtggt tggtgaatat   1080
     303 ggctgaagga gacccagaag cccaaaggag ggtacccaag aaccccaagt ataacacaca   1140
     305 aagagcggag agagagacac aggacagtgg ttctgggaac gatgatggtg gcttcagtga   1200
     307 ggagtgggag gcccaaagag acagtcacct ggggcctcat cgctccactc ccgagtcaag   1260
     309 agctgctgtc caggaacttt ctgggagcat tctaacgagt gaagacccgg aggaaagagg   1320
     311 agtaaaactt ggactgggag atttcatttt ctacagtgtt ctggttggta aggcctcagc   1380
     313 aaccgccagt ggagactgga acacaaccat agcctgcttk gtagccatac tgatcggcct   1440
W--> 315 gtgccttana ttactcctgc tcgccattta caagaaaggg tngccagccc ncccatctc    1500
W--> 317 catcaccttc gggttcgtgt tctncttcgc cacggattac cttgtgcagc ccttcatgga   1560
     319 ccaacttgca ttccatcagt tttatatcta gcctttctgc agttagaaca tggatgtttc   1620
     321 ttctttgatt atcaaaaaca caaaaacaga gagcaagccc gaggaggaga ctggtgactt   1680
     323 tcctgtgtcc tcagctaaca aaggcaggac tccagctgga cttctgcagc ttccttccga   1740
     325 gtctccctag ccacccgcac tactggactg tggaaggaag cgtctacaga ggaacggttt   1800
     327 ccaacatcca tcgctgcagc agacggtgtc cctcagtgac ttgagagaca aggacaagga   1860
     329 aatgtgctgg gccaaggagc tgccgtgctc tgctagcttt ggmccgtggg catggagatt   1920
     331 tacccgcac                                                         1929
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     335 <211> LENGTH: 467
     336 <212> TYPE: PRT
     337 <213> ORGANISM: Mus musculus
     339 <220> FEATURE:
     340 <221> NAME/KEY: MISC_FEATURE
     341 <222> LOCATION: (1)..(467)
     342 <223> OTHER INFORMATION: where X is unknown or other
     345 <400> SEQUENCE: 4
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     348 1               5                   10                  15
     351 Ser Glu Asp Ser His Ser Ser Ser Ala Ile Arg Ser Gln Asn Asp Ser
     352                 20                  25                  30
     355 Gln Glu Arg Gln Gln Gln His Asp Arg Gln Arg Leu Asp Asn Pro Glu
     356             35                  40                  45
     359 Pro Ile Ser Asn Gly Arg Pro Gln Ser Asn Ser Arg Gln Val Val Glu
```

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```
       360     50                    55                    60
       363 Gln Asp Glu Glu Glu Asp Glu Glu Leu Thr Leu Lys Tyr Gly Ala Lys
       364 65                    70                    75                    80
       367 His Val Ile Met Leu Phe Val Pro Val Thr Leu Cys Met Val Val Val
       368               85                    90                    95
       371 Val Ala Thr Ile Lys Ser Val Ser Phe Tyr Thr Arg Lys Asp Gly Gln
       372               100                   105                   110
       375 Leu Ile Tyr Thr Pro Phe Thr Glu Asp Thr Glu Thr Val Gly Gln Arg
       376         115                   120                   125
       379 Ala Leu His Ser Ile Leu Asn Ala Ala Ile Met Ile Ser Val Ile Val
       380         130                   135                   140
       383 Ile Met Thr Ile Leu Leu Val Val Leu Tyr Lys Tyr Arg Cys Tyr Lys
       384 145                   150                   155                   160
       387 Val Ile His Ala Trp Leu Ile Ile Ser Ser Leu Leu Leu Leu Phe Phe
       388               165                   170                   175
W--> 391 Phe Ser Phe Ile Tyr Leu Gly Glu Val Phe Lys Thr Tyr Asn Val Xaa
       392               180                   185                   190
       395 Val Asp Tyr Val Thr Val Ala Leu Leu Ile Trp Asn Trp Gly Val Val
       396               195                   200                   205
       399 Gly Met Ile Ala Ile His Trp Lys Gly Pro Leu Arg Leu Gln Gln Ala
       400         210                   215                   220
       403 Tyr Leu Ile Met Ile Ser Ala Leu Met Ala Leu Val Phe Ile Lys Tyr
       404 225                   230                   235                   240
       407 Leu Pro Glu Trp Thr Ala Trp Leu Ile Leu Ala Val Ile Ser Val Tyr
       408               245                   250                   255
       411 Asp Leu Val Ala Val Leu Cys Pro Lys Gly Pro Leu Arg Met Leu Val
       412               260                   265                   270
       415 Glu Thr Ala Gln Glu Arg Asn Glu Thr Leu Phe Pro Ala Leu Ile Tyr
       416         275                   280                   285
       419 Ser Ser Thr Met Val Trp Leu Val Asn Met Ala Glu Gly Asp Pro Glu
       420         290                   295                   300
       423 Ala Gln Arg Arg Val Pro Lys Asn Pro Lys Tyr Asn Thr Gln Arg Ala
       424 305                   310                   315                   320
       427 Glu Arg Glu Thr Gln Asp Ser Gly Ser Gly Asn Asp Asp Gly Gly Phe
       428               325                   330                   335
       431 Ser Glu Glu Trp Glu Ala Gln Arg Asp Ser His Leu Gly Pro His Arg
       432               340                   345                   350
       435 Ser Thr Pro Glu Ser Arg Ala Ala Val Gln Glu Leu Ser Gly Ser Ile
       436         355                   360                   365
       439 Leu Thr Ser Glu Asp Pro Glu Glu Arg Gly Val Lys Leu Gly Leu Gly
       440·        370                   375                   380
       443 Asp Phe Ile Phe Tyr Ser Val Leu Val Gly Lys Ala Ser Ala Thr Ala
       444 385                   390                   395                   400
W--> 447 Ser Gly Asp Trp Asn Thr Thr Ile Ala Cys Xaa Val Ala Ile Leu Ile
       448               405                   410                   415
W--> 451 Gly Leu Cys Leu Xaa Leu Leu Leu Leu Ala Ile Tyr Lys Lys Gly Xaa
       452               420                   425                   430
W--> 455 Pro Ala Xaa Pro Ile Ser Ile Thr Phe Gly Phe Val Phe Xaa Phe Ala
       456               435                   440                   445
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<u>Please Note:</u>
Use of n and/or Xaa have been detected in the Sequence Listing. Please review the
Sequence Listing to ensure that a corresponding explanation is presented in the <220>
to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:1; N Pos. 106
Seq#:3; N Pos. 5,9,1449,1482,1491,1524
Seq#:4; Xaa Pos. 192,411,421,432,435,446
Seq#:5; N Pos. 360
Seq#:6; N Pos. 4,8,23,42,45,60,68,174,182,239,383,488,525,939
Seq#:7; N Pos. 169,235,267,277,321,348,354,379,422
Seq#:8; N Pos. 52,133
Seq#:9; N Pos. 263,297,302,312,320,346,355,572,843,890,914,931,991,1119
Seq#:9; N Pos. 1184,1314,1331,1359,1362,1370,1418,1479,1509,1587,1592,1598
Seq#:9; N Pos. 1601,1612,1652,1668,1704,1711
Seq#:10; N Pos. 2,26,28,64,65,85,329,605,777,824,833,1031,1104,1151,1218
Seq#:10; N Pos. 1238,1239,1300,1650,1798,1810,1834,1844
Seq#:11; N Pos. 22,26,44,47,49,68,81,104,107,119,125,131,137,150,184,188
Seq#:11; N Pos. 237,248,250,252,274,338,339,340,524,525,562,591,629,659,666
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Seq#:19; N Pos. 204,221,238,241,313,333,335,339,343,364,370,377
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Seq#:25; N Pos. 105,107,148,211,235,255,264,269,274,281,302,327,336,350,363
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Output Set: **N:\CRF4\12312002\I689159A.raw**

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Seq#:36; N Pos.  135,138,145,150,162,180,196,200,243,250,311,319,347,359,366
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Seq#:37; N Pos.  301,316
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Seq#:39; N Pos.  19,48,49,52,57,62,77,81,107,111,113,116,123,144,154,175,181
Seq#:39; N Pos.  182,186,189,190,197,198,209,211,213,216,219,222,234,244,263
Seq#:39; N Pos.  265,268,274,278,288,294,295,299,303,305,324
Seq#:40; N Pos.  17,40,65,119,160,177,233,268,297,367,376,381,408
Seq#:41; N Pos.  34,52,62,71,75,103,110,145,186,215,218,232,243,251
Seq#:42; N Pos.  20,28,32,61,69,91,95,117,120,131,140,146
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Seq#:43; N Pos.  559,570
Seq#:44; N Pos.  11,32,238,247,296,309,315,329
Seq#:45; N Pos.  52,133,160,284,371,373,383,389,390,406,419
Seq#:46; N Pos.  12,88,185,235,269,301,309,315,319,334,364,379,385
Seq#:47; N Pos.  3,19,22,32,50,91,92,124,166,171,175,192,212,258,278,303,305
Seq#:47; N Pos.  325,335,354,357,369,375,422,446,471,479,483
Seq#:48; N Pos.  12,13,70,120,129,166,177,233,234,291,347,348,372,426
Seq#:49; N Pos.  64,110,117,170,257,306,315,330,336,353,365
Seq#:50; N Pos.  19,64,163,225,283,301,373,409,440,443,453,471,475,482,484
Seq#:51; N Pos.  58,59
Seq#:52; N Pos.  204
Seq#:53; N Pos.  8,69,125,126,177,265,314,338,361
Seq#:54; N Pos.  213,225,240,248,260,296,318,330,368,402,494,500,514,518
Seq#:55; N Pos.  6,16,19,25,28,52,73,109,190,192,206,232,246,248,275,283,292
Seq#:55; N Pos.  308,338,389,390,391,416,423,502,515
Seq#:56; N Pos.  40,166,253,377,379,383,402,418,437,451,484
Seq#:57; N Pos.  7,147,258,272,305,306,358,374,389,402,413,423,424,426,472
Seq#:58; N Pos.  78,243,289,345,365,380,386,402,408,409,410,411
Seq#:59; N Pos.  40,253,301,335,361,379,384,397,404,412,418,425,427,436,455
Seq#:59; N Pos.  461,494,509
Seq#:60; N Pos.  11,150,241,242,367
Seq#:61; N Pos.  356,358,363
Seq#:62; N Pos.  11,116,260,317,325,361,431,439,445,457,476,491,495
Seq#:63; N Pos.  13,262,319,433,456
Seq#:64; N Pos.  30,365,368
Seq#:65; N Pos.  199,223,233,238,256,282,291
Seq#:66; N Pos.  7,130,178,197,305,332,339,356,380,415,422,433,436,440
Seq#:67; N Pos.  289,345,356,407,421,428,433,434,441,443,446
Seq#:68; N Pos.  4,45,57,309,310,311,347,369
Seq#:69; N Pos.  88,192,253,283,361,366,372,375,386,426,442,478,485
Seq#:70; N Pos.  390,400
Seq#:71; N Pos.  45,385,413,416,424
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RAW SEQUENCE LISTING ERROR SUMMARY   DATE: 12/31/2002
PATENT APPLICATION: US/09/689,159A   TIME: 14:09:12

Input Set : A:\Sequence Listing (ASCII copy) - US7.txt
Output Set: N:\CRF4\12312002\I689159A.raw

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Seq#:72;  N Pos.  60,92,101,138,160,234,255,263,270,284,297,298
Seq#:73;  N Pos.  135,148,157,158,163,169,235,267,277,321,348,354,379,422
Seq#:74;  N Pos.  7,23,36,48,67,445
Seq#:75;  N Pos.  7,389
Seq#:76;  N Pos.  52,94,104,304,325,401,448
Seq#:77;  N Pos.  101,102,132,228,396,419,439,445,467
Seq#:78;  N Pos.  53,54,115
Seq#:79;  N Pos.  49,236,270,434,443,490
Seq#:80;  N Pos.  14,285,407,472
Seq#:81;  N Pos.  5,159,189,190,191,307,319,343,353
Seq#:82;  N Pos.  33,53,72,81,83,87,124,188,191,233,367,401,416,422,424,439
Seq#:82;  N Pos.  460,471,480,492
Seq#:83;  N Pos.  54,75,257,295,333,386,409,411,414,447
Seq#:84;  N Pos.  18,139,157,170,178,230,257,277,363,373,388,437
Seq#:85;  N Pos.  292,312,351
Seq#:86;  N Pos.  199,446,483
Seq#:87;  N Pos.  392,399,439
Seq#:88;  N Pos.  469,487,500
Seq#:89;  N Pos.  49,114,302,319,343,367,470,484
Seq#:90;  N Pos.  12,20,24,124,155,262,293,299,374,392,419,426,431,458,467
Seq#:90;  N Pos.  475,485,486,488,490,491,494
Seq#:91;  N Pos.  56,139,418,438,439,475,477,501
Seq#:92;  N Pos.  109
Seq#:93;  N Pos.  30,479,484
Seq#:94;  N Pos.  53,145,204,260,266,283,305,318,337,339,342,360,364
Seq#:95;  N Pos.  25,26,77,78,142,164,166,179,232,264,277,295,310
Seq#:96;  N Pos.  6,25,33,68,123,131,165,183,201,202,227,267,273,282,304,309
Seq#:96;  N Pos.  310,315,319,326,342,347,362,367,370,371
Seq#:97;  N Pos.  47,149,182,249,250,277,280,340,345
Seq#:98;  N Pos.  25,159,162,165,196
Seq#:99;  N Pos.  282,369,374,421
Seq#:100; N Pos.  23,39,44,65,68,84,141,142,179,208,246,276,283,308,380,393
Seq#:100; N Pos.  406,416,424
Seq#:101; N Pos.  252,409,434
Seq#:102; N Pos.  84,146,240,335,414
Seq#:103; N Pos.  144,171,172,217,219,270,315,352,353,358,359,362,369
Seq#:104; N Pos.  222
Seq#:105; N Pos.  84,230,269,283,353,356,371,382,390,407,411
Seq#:106; N Pos.  190,348,421,439
Seq#:107; N Pos.  145,157,168,180,183,184,189
Seq#:108; N Pos.  216,419,471
Seq#:109; N Pos.  94,96,120,122,359,388,432,459
Seq#:110; N Pos.  24,27,89,288,392,476,482
Seq#:111; N Pos.  97,122,190,191,192,307,324,449,475,480,496,499,520,523,539
Seq#:112; N Pos.  1,2,6,8,10,11,12,13,14,15,16,17,20,21,23,43,70,73,98
Seq#:113; N Pos.  8,11,12,13,14,15,20,21,44,341,372,415,429,464,496,526,588
Seq#:113; N Pos.  637,640,664,674,680,681,686,689,692,696,703,709,730,733
Seq#:113; N Pos.  740,755,767,773,781,786,795,801,805,818,819,829
Seq#:114; N Pos.  7,9,20,28,30,33,37,43,45,46,47,51,53,54,70,96,109,115,116
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RAW SEQUENCE LISTING ERROR SUMMARY   DATE: 12/31/2002
PATENT APPLICATION: **US/09/689,159A**   TIME: 14:09:12

Input Set : **A:\Sequence Listing (ASCII copy) - US7.txt**
Output Set: **N:\CRF4\12312002\I689159A.raw**

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Seq#:114; N Pos. 120,127,135,140,153,157,158,168,171,182,183,186,190,193
Seq#:114; N Pos. 196,198,211,214,217,219,220,221,225,227,230,231,234,239
Seq#:114; N Pos. 243,244,253,254,256,262,263,264,274,275,277,278,289,292
Seq#:114; N Pos. 293,301,303,312,316,317,322,323,324,326,327,328,331,335
Seq#:114; N Pos. 340,347,349,351,353,354,356,357,362,363,364,366,367,368
Seq#:114; N Pos. 369,371,373,375,378,380,384,389,390,391,392,394,395,396
Seq#:114; N Pos. 398,401,402,403,405,407,408,413,418,420,422,428,429,431
Seq#:114; N Pos. 433,434,436,439,440,442,449,451,456,458,459,468,469,471
Seq#:114; N Pos. 472,473,475,484,486,490,492,493,495,497,498,500,503,505
Seq#:114; N Pos. 506,508,517,518,529,531,539,541,546,549,552,553,557,561
Seq#:114; N Pos. 565,567,568,572,573,582,588,589,602,608,611,614,618,619
Seq#:114; N Pos. 622,626,631,635,636,639,640,643,648,652,655,660,661,664
Seq#:114; N Pos. 666,678,682,688,692,696,698,699,700,709,715,717,718,719
Seq#:114; N Pos. 723,724,725,726,731,733,734,740,745,747,750,751,756,764
Seq#:114; N Pos. 768,775,777,778,780,781,787,788,789,790,793,794,796,797
Seq#:114; N Pos. 798,804,806,809,810,812,813,814,815,818,820,827,829,831
Seq#:114; N Pos. 833,834
Seq#:115; N Pos. 33,39,65,418,478,487,522,543,546,565,566,570,578,579,580
Seq#:115; N Pos. 588,592,598,599,602,606,610,611,620,642,678,697,704,705
Seq#:115; N Pos. 706,707,708,709,710,711,712,713,714,715,716,717,718,719
Seq#:115; N Pos. 721,723,724,726,727,729,731,732,733,736,737,739,740,741
Seq#:115; N Pos. 742,743,749,750,751,752,754,755,756,757,761,762,763,766
Seq#:115; N Pos. 767,768,769,770,771,773,774,775,776,777,778,780,781,782
Seq#:115; N Pos. 783,786,789,791,792,793,795,797,798,799,800
Seq#:116; N Pos. 2,3,4,5,6,7,8,12,13,15,19,216,421,443,444,464,475,478,481
Seq#:116; N Pos. 483,486,487,489,491,494,499,507,512,518,526,531,542,550
Seq#:116; N Pos. 554,557,560,564,572,577,582,583,588,591,592,593,594,597
Seq#:116; N Pos. 599,601,602,604,606,608,609,613,614,615,620,621,622,624
Seq#:116; N Pos. 630,631,632,636,641,642,647,649,653,654,655,656,660,665
Seq#:116; N Pos. 666,667,669,670,671,672,673,674,678,681,684,686,689,690
Seq#:116; N Pos. 691,692,695,697,698,699,700,701,703,704,705,706,707,708
Seq#:116; N Pos. 709,712,716,717,720,721,722,724,727,729,730,732,733,735
Seq#:116; N Pos. 736,738,739,740,741,742,744,745,746,747,748,749,750,751
Seq#:116; N Pos. 752,755,757,758,759,761,762,763,764,765,766,767,768,771
Seq#:116; N Pos. 772,773,774,775,776
Seq#:117; N Pos. 1,2,3,4,5,6,7,8,9,12,13,14,15,16,17,22,23,30,34,126,265
Seq#:117; N Pos. 396,403,404,607,631,632,641,660,669,671,673,685,691,699
Seq#:117; N Pos. 710,721,724,729,734,759,768,784,792,794
Seq#:118; N Pos. 2,5,6,7,8,10,11,12,13,14,15,22,27,253,444,476,516,538,547
Seq#:118; N Pos. 553,590,634,676,697,707,729,742,748,774,798,811,818
Seq#:119; N Pos. 2,502,607,656,674,680,696,719,738,739,748,749,750,765,766
Seq#:119; N Pos. 770,784,794
Seq#:120; N Pos. 11,18,55,67,72,132,532,559,594,614,624,660,665,672,730,734
Seq#:120; N Pos. 747,755,777,778,779,783
Seq#:121; N Pos. 170,376,515,572,628,693,718,724,725,756,761,776,778,791
Seq#:122; N Pos. 130,143,152,153,158,164,230,262,272,316,343,349,374,417
Seq#:123; N Pos. 11,35,155,336,402,435,441,443
Seq#:124; N Pos. 119,123,164,178,186,212,261,304,318,322,332,348,351,364
Seq#:125; N Pos. 52,133
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RAW SEQUENCE LISTING ERROR SUMMARY   DATE: 12/31/2002
PATENT APPLICATION: **US/09/689,159A**   TIME: 14:09:12

Input Set : **A:\Sequence Listing (ASCII copy) - US7.txt**
Output Set: **N:\CRF4\12312002\I689159A.raw**

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Seq#:135; N Pos. 5,9
Seq#:136; Xaa Pos. 192,411,421,432,435,446
Seq#:137; N Pos. 2137,2144,2152,2157,2160,2163,2180,2203,2213,2216,2225
Seq#:150; N Pos. 12,532,576,592,626,634,643,777,805,808,811,877,909,919,963
Seq#:150; N Pos. 990,996,1021,1064
Seq#:151; N Pos. 94,159,172,254,268,276,385,676
Seq#:152; N Pos. 263,297,302,312,320,346,355,572,843,890,914,931,991,1119
Seq#:152; N Pos. 1184,1314,1331,1359,1362,1370,1418,1479,1509,1587,1592
Seq#:152; N Pos. 1598,1601,1612,1652,1668,1704,1711
Seq#:153; N Pos. 2,26,28,64,65,85,329,605,777,824,833,1031,1104,1151,1218
Seq#:153; N Pos. 1238,1239,1300,1650,1798,1810,1834,1844
Seq#:154; N Pos. 121,138,161,165,181,239,295,662,744,747,748,751,898,903
Seq#:154; N Pos. 1502,1803,1850,1852,1921,1935
Seq#:156; N Pos. 144,145,157,168,171,172,217,219,270,315,347,356,357,363
Seq#:156; N Pos. 364,367,372,374,529,536,676,681,755,804,822,916,929,987
Seq#:156; N Pos. 1004,1014,1067,1094,1116
Seq#:157; N Pos. 97,122,190,191,192,307,327,448,474,479,495,498,519,522,538
Seq#:158; N Pos. 8,46,161,170,182,213,234,238,250,291,312,325,337,364,433
Seq#:158; N Pos. 434,435
Seq#:159; N Pos. 22,26,44,47,49,68,81,104,107,119,125,131,137,150,184,188
Seq#:159; N Pos. 237,248,250,252,274,338,339,340,524,525,562,591,629,659
Seq#:159; N Pos. 666,691,763,776,789,799,807
Seq#:160; N Pos. 4,8,23,42,45,60,68,174,182,239,383,488,525,939
Seq#:179; N Pos. 20
Seq#:181; N Pos. 13,16
Seq#:182; N Pos. 14
Seq#:184; N Pos. 2,4,5,6,7,8,9,10,11,12,13,14,15,16,17,22,34,58,67,173
Seq#:185; N Pos. 3,4,5,6,7,8,9,10,11,16,36,59,71,173,182,190,204
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VERIFICATION SUMMARY   DATE: 12/31/2002
PATENT APPLICATION: **US/09/689,159A**   TIME: 14:09:12

Input Set : **A:\Sequence Listing (ASCII copy) - US7.txt**
Output Set: **N:\CRF4\12312002\I689159A.raw**

```
L:35  M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1 after pos.:60
L:267 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3 after pos.:0
L:315 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3 after pos.:1440
L:317 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3 after pos.:1500
L:391 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4 after pos.:176
L:447 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4 after pos.:400
L:451 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4 after pos.:416
L:455 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4 after pos.:432
L:489 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:300
L:596 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6 after pos.:0
L:598 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6 after pos.:60
L:600 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6 after pos.:120
L:602 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6 after pos.:180
L:608 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6 after pos.:360
L:612 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6 after pos.:480
L:626 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6 after pos.:900
L:645 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:120
L:647 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:180
L:649 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:240
L:651 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:300
L:653 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:360
L:655 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:7 after pos.:420
L:670 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:8 after pos.:0
L:674 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:8 after pos.:120
L:709 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:240
L:711 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:300
L:719 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:540
L:729 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:840
L:731 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:900
L:733 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:960
L:737 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1080
L:739 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1140
L:743 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1260
L:745 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1320
L:747 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1380
L:749 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1440
L:751 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1500
L:753 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1560
L:755 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1620
L:757 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1680
L:772 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:0
L:774 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:60
L:782 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:300
L:792 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:600
L:796 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:720
L:798 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:780
L:806 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:1020
L:808 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:1080
```

VERIFICATION SUMMARY
PATENT APPLICATION: **US/09/689,159A**

DATE: 12/31/2002
TIME: 14:09:12

Input Set : **A:\Sequence Listing (ASCII copy) - US7.txt**
Output Set: **N:\CRF4\12312002\I689159A.raw**

```
L:810 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:1140
L:812 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:1200
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